REPUBLIC OF MOLDOVA

SERVICE QUALITY STANDARDS

Regulatory Development
and Power Market Operations

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Contents

QUALITY OF SERVICE STANDARDS

1. INTRODUCTION

The purpose of quality of service standards is to set a common framework for customer service by the electric power distribution companies. This framework is intended to ensure a minimum level of service for all customers and to encourage electric companies to aim for higher levels.

Quality of service standards address the elements of service provided by electric power distribution companies to their customers, which these customers especially value. These elements include the reliability and quality of the connection and the electric power supply; the speed and effectiveness of responding to inquiries, requests, and problems; the price of the services provided; and courtesy of the customer service personnel.

Quality of service standards never existed in Moldova per se, although in the former Soviet Union certain operating rules or standards were applicable as outlined in *Rules of Power Facilities Installation*. These rules included provisions regarding normal electric power supply restoration time after the fault; requirements for notification of the customers about upcoming planned outages; penalties applied by Minenergo to the electric companies for unreasonable actions that resulted in disconnection of their customers from the grid. However, no regulatory body in fact monitored the quality of service provided by the companies and enforced the rules. Therefore, the customers were seldom, if ever, compensated for any damages and losses associated with the power suppliers' failures to provide reliable and quality service.

At present, the electric power industry in Moldova is in transition to the establishment of a power market which is intended to perform on a commercial, non-governmental basis. The customers tariffs for electricity now reflect the real production costs and, therefore, customers who pay may reasonably anticipate a better quality of service. With the anticipated introduction of private investors to purchase and operate distribution and generation assets during 1999, development and implementation of the quality of service standards are an immediate necessity both to inform potential investors of their expected performance and to provide protections to consumers.

ANRE's role in the introduction of quality of service standards can hardly be overestimated; in fact, it is threefold:

- First, ANRE should design and set the standards;
- Second, ANRE should establish a framework and rules for monitoring quality of service provided by the regulated electric power distribution companies; and
- Finally, ANRE should set the rules and guidelines for enforcement of the standards.

The purpose of this paper is:

- to assist ANRE in determination of the elements of service whose level of quality needs to be standardized;
- to suggest possible mechanisms of quality of service standards for ANRE's consideration;

- to explain the regulatory framework associated with the monitoring of quality of service; and
- to make recommendations regarding setting the administrative rules and regulations for enforcement of the standards.

2. ELEMENTS OF SERVICE

There are two distinct groups of elements of service, which are the focus of this discussion:

(1) the elements of service related to the reliability and quality of the connections and electric power supply; and

(2) the elements of service associated with the companies' communication and management practices of handling the customers' complaints, inquiries, requests, and other problems.

In general, the first group may encompass the following elements:

- Reconnection of customers following faults within certain period of time after the fault.
- Correction of voltage faults within certain period of time after the problem was identified.
- Connecting new tariff customers' premises to electricity distribution system within certain period of time after filing application for service.
- Reconnection within certain period of time of customers who have been cut off for nonpayment after they have paid the bill or made arrangements to pay.
- Visiting to move a meter when asked to do so by customer, within certain period of time after the request.
- Changing meters where necessary on change of the tariff within certain period of time after the domestic customers' requests.
- Ensuring that the company obtains a firm reading for the customers' meters on a regular predetermined basis.
- Prompt replacement of the supplier's blown fuses.

The second group of the elements of service typically includes the following characteristics:

- Responsiveness to the customer letters.
- Estimating charges in a timely manner upon request.

- Notice of supply interruption should be made in advance.
- Charges and payment inquiries should be addressed within a certain period of time.
- All appointments must be kept.
- Payments owed under the Standards should be paid without delays.

Of course, there could be some flexibility in determination of the groups of service elements, as well as in selection of particular characteristics comprising the groups. Thus, ANRE may consider incorporating any unique specific characteristics into the scope of standards, which target problematic elements of service valued by the Moldovan customers (e.g., unreasonable and deliberate disconnections, inadequate capability of the electric company customer service telephone network, etc.).

3. MECHANISMS OF STANDARDS

Various alternative approaches could be recommended to ANRE regarding development of the mechanisms of the quality of service standards. One of them is based on the model adopted in the United Kingdom.

There are two groups of standards in force in the United Kingdom:

- Guaranteed Standards; and
- Overall Standards.

The *Overall Standards* cover areas of service where it is not appropriate to give individual guarantees, but where customers in general have a right to expect from companies predetermined minimum levels of service. The Overall Standards set minimum levels of performance which companies are required to achieve over a 12 month period in specific service areas. Basically, the Overall Standards cover the elements of service identified in the first group, above (except for the last element related to the replacement of the supplier's fuses -- this one is covered in the Guaranteed Standards discussed below). The Overall Standards set minimum percentage of cases in which the companies should provide services within certain time limits.

Although there is no obligation to make a payment to the customer if a company fails to meet the Overall Standard, each company has a duty to conduct its business in such a way as can reasonably be expected to lead to its achieving the Overall Standards. To ensure that companies account to their customers on the Overall Standards, the regulatory agency has directed each company to give information to customers about its performance under the Overall Standards. This is a further pressure on companies to achieve the required levels of performance.

Guaranteed Standards set service levels which must be met in each individual case. If the company fails to provide the level of service required, it must make a payment to the customer affected. The Guaranteed Standards cover the following service areas:

- supplier's fuse failures;
- restoring electricity supplies after faults;
- providing supply and meter;
- estimating charges;
- notice of supply interruption;
- voltage complaints;
- meter problems;
- charges and payment queries;
- appointments;
- payments owed under standards.

These Standards have been set to guarantee a level of service which it is reasonable to expect companies to deliver in all cases. According to the Guaranteed Standards, each company should provide all the above-mentioned services within certain period of time. A customer who fails to receive the required level of service is entitled to a payment, typically £20. However, the companies do not have to make payments if failure is caused by severe weather or other matters outside their control. The companies are also required to send an explanatory leaflet to customers at least once a year.

If ANRE prefers to adopt a model similar to the British model, it may consider introduction of penalties. One or two years of experience will demonstrate how these penalties affect the electric companies' revenues and profits. Based on these actual performance results, the penalties may be further revised by ANRE, if necessary.

As an alternative method, ANRE may consider a mechanism of imposing a cumulative penalty based on the individual performance factors for each specific performance characteristic. These penalties may affect the low voltage network operator companies' rate of return, level of profit, or total revenues. Under this scenario, the penalties would not be distributed to the particular aggrieved customers, but rather would affect the prices paid by all ratepayers.

The performance-based adjustment factor could be calculated for each regulated distribution company on an annual basis. The major advantage of this method is that it allows imposition of penalties for areas of service where giving individual guarantees is inappropriate or simply impossible. In addition, this method, which could be easily enforced, looks more attractive due to its administrative simplicity. Finally, ANRE may consider a combination of the two methods, so that all the performance elements would be covered through either one or another mechanism, as seems more appropriate.

4. SERVICE QUALITY MONITORING

The process of monitoring of quality of service is very important for the verification purposes. Without capability to properly monitor the electric distribution companies' actual performance characteristics, ANRE would not be capable of handling its control function and, ultimately, would not be able to enforce its quality of service standards. It is also true that some elements of quality of power supply, which are valued by all groups of customers (e.g., voltage profile control) is an important component of quality of service. However, it is not appropriate for a regulatory agency like ANRE to be physically involved in routine field testing of the electrical equipment for the purposes of verification whether or not a licensee meets technical requirements of the quality of service standards.

Quality of power is a term often used in describing an aspect of the electricity supply dealing with the problems manifested in voltage, current, or frequency deviation that may result in failure or malfunctioning of electronic equipment. These could be voltage dips and fluctuations, momentary interruptions, harmonics and transients, and other types of disturbances, such as impulses and swells (dynamic over-voltage). Accordingly, power quality standards establish voltage, current, and frequency distortion limits (or benchmarks), and the limits of their long- and short-term acceptable deviations from nominal ratings under normal and emergency conditions.

Disturbances and deviations of voltage, current, and frequency have always existed on electric power systems. However, even ten years ago, power quality was not a worry, because it had no effect on most loads connected to electric distribution systems. Nowadays, low power quality may have enormous economic implications. For example, a two-second loss of voltage at a computer center may destroy hours of data processing or hundreds of thousands of dollars worth of work. Even worse, at large machining plants, a fraction-of-a-second voltage sag may cause heavy production and quality losses. However, these problems, adversely affecting primarily high-tech companies employing sophisticated electronic equipment, have virtually no serious implications for an average customer (except for blinking digital clock in the morning and being late at work).

There are several standards of power quality available that have been recommended by prominent institutions like IEEE, ANSI, EPRI, CENELEC, etc.[1] Several state regulatory commissions in the US are contemplating adoption of some of the power quality standards that would establish a guaranteed minimum level of quality of power supply required by all groups of customers. These power quality standards are not mandatory for electric power companies unless they are explicitly adopted by the state regulatory agencies and commissions.

There are some power quality standards in Moldova setting limits on the deviation of frequency and voltage, which however are not currently fully enforced. Formerly, Minenergo of the

[1] IEEE - the Institute of Electrical and Electronics Engineers, Inc.
ANSI - American National Standards Institute.
EPRI - Electric Power Research Institute.
CENELEC - Comité Européen de Normalisation Electrotechnique (European Committee for Electrotechnical Standardization).

USSR, the Energonadzor, and GosStandard were involved in setting the power quality standards, their monitoring, and enforcement. Of course, ANRE may also consider adopting similar power quality standards; however, it is our recommendation that ANRE consider adoption, monitoring, and enforcement of only those components of the power quality standards which are essential for all customers without exception.

Not all customers have the same requirements for quality of power supply. However, it is not ANRE's function to address through the quality of service standards all possible needs of all groups of customers. The purpose of the quality of service standards is to set a guaranteed minimum level of service quality, which is essential for absolutely all groups of customers. If any customer requires a level of quality of service higher than average (e.g., uninterruptible power supply, precise frequency and voltage control, priority for reconnection after a fault, etc.), he may procure these services through special contracts with his power supplier, or through the purchase of special equipment.

Services targeting enhancing of power quality become part of ancillary services provided on a competitive basis by electric power suppliers and other electric power market participants worldwide. Customers requiring premium levels of power quality may install additional equipment at their premises or, perhaps, purchase such services from competing suppliers and pay extra charges. Generally, ANRE would not be involved in monitoring their quality. All disputes regarding power quality between customers provided with premium levels of power quality and their suppliers will be considered in court, and the provisions of the contract will be the basis for the court decision.

In addition, the System Operator, acting as a system coordinator, will obligate the low voltage network operators to provide reactive power compensatory equipment in their distribution systems to correct power factor within their franchise territory. Those customers, who detrimentally affect the voltage profile on the distribution feeder, or draw reactive power from the bulk power system, would be subject for penalties set and enforced by Market Rules.

In Moldova the essential elements of service valued by all groups of customers are long-term deviations of voltage and frequency from their normal ratings, which are 220 V and 50 Hz, respectively. However, frequency is not under control of a low voltage distribution company, but rather depends on a balance between generation and consumption on the entire system, which, in turn, is dictated by Ukraine because of the influence of that important interconnection. Therefore, no reasons exist to incorporate the incentives targeting improvement of frequency into the scope of quality of service standards for distributors. Accordingly, only one element of power quality standards, i.e., long-term deviation range for the low voltage amplitude could be possibly incorporated into the Moldovan quality of service standards.

No sophisticated measuring devices are required to monitor, inspect, and test long-term deviations of voltage, and the instruments required for such testing (basically, regular voltmeters) are available in Moldova. However, the bottom line is that, for the reasons explained below, ANRE should not procure even this simple measuring instrumentation.

Numerous cases of the customers' complaints and disputes about low quality of power may emerge nationwide, and if ANRE assumes a low voltage network operators's direct responsibility of inspecting and analyzing the voltage problems, they would gladly delegate it to ANRE technical staff. As a result, ANRE technical staff would be overwhelmed with the tremendous amount of field tests and inspections required to address all the complaints nationwide. This would deflect ANRE limited human resources from other issues and tasks of regulatory nature.

It would be more practical to obligate the low voltage network operators to address the problem themselves, since it is their direct responsibility to ensure adequate level of service to their customers. Most likely, in the majority of cases the problem would be mitigated after this initial step. However, if the electric company cannot or is unwilling to correct the problem, some other organizations, specializing in the electric power system testing and inspection, should be engaged.

Of course, these organizations should be engaged only if a low voltage network operator and its complaining customer cannot settle their dispute without ANRE's involvement. Then ANRE may exercise its authority and order an audit by an independent party, and the electric company should pay for the auditor's inspection and testing services.[2] A report prepared by an independent auditor would be part of the record in the ANRE's adjudicatory proceedings, and ANRE would rely on the report conclusions and recommendations while making its decision. Under this scenario, ANRE's decision will be less subject to court appeals.

ANRE technical staff should focus on the *monitoring* of the performance aspects directly related to the quality of service provided by the regulated companies to their customers. ANRE should establish a reporting framework and collect all relevant performance information from the companies on an annual basis in an approved format. ANRE should also develop publicly available transparent rules and guidelines, which would guide the customers if they are unsatisfied with the level of quality of service provided by their electric companies.

5. ENFORCEMENT OF STANDARDS

Introduction of a performance-based regulation, such as quality of service standards, may not be welcomed by the regulated electric companies, since these regulatory mechanisms offer financial penalties for non-compliance with the standards, and do not explicitly reward superior performance (just a stick, and no carrot). Therefore, without thoroughly designed regulatory framework, e.g., procedures, rules, and guidelines for enforcement of the standards, the entire system may become inefficient, and the goal will not be achieved.

We envision several problems and pitfalls, which may diminish the effectiveness of the quality of service standards, if they are not addressed. First, relatively inferior physical condition of the low voltage distribution systems, especially micronets,[3] will precipitate low reliability of power

[2] Clear understanding of the ANRE's powers to order an independent audit for the electric company's expense would be a strong incentive for electric companies to resolve the problems with their customers before the customers bring their cases to NERC.

[3] Micronets are low voltage networks owned by the primary, often industrial customers, who resale electricity to the

supply to the customers. Thus, if the standards of the elements of service depending on the physical condition of the network (e.g., restoration time after a fault, etc.) are set unrealistically high, without consideration of the reality, the electric companies will be excessively penalized. However, the standards should still be set at a challenging level to encourage improvements in all areas of customer service. In other words, the benchmarks for the standards should be set appropriately, and should be revised annually based on the actual performance results.

Second, the amount of individual penalties should be set carefully, because the penalties affect the companies revenues and may have a potential to compromise the companies' financial health. This is especially true, if ANRE prefers to adopt the British model, which does not feature any price cap mechanism to limit the companies' financial losses caused by non-compliance with the standards. In contrast, applying penalties calculated in percent in an aggregate form provides an opportunity to restrict the overall amount of monetized penalties implied, e.g., if ANRE adopts a model where the aggregate performance factor affects the companies' profits only. If the amount of individual penalties are set too low, the customers may simply neglect to file a complaint and pursue the issue, which would result in misrepresentation of the performance data.

Third, the entire system will be ineffective if ANRE is not able to obtain reliable information for evaluation of the companies' performance. Obtaining reliable information is especially important, if ANRE sets a performance-based adjustment factor that would affect the companies' profits. The apathetic customers may exacerbate the problem, because they may not be willing to complain about inadequate service, especially if they are not to receive any direct compensation for the damages. Some customers will not complain about inadequate service just because they do not trust the system and have no guarantees their interests will be effectively protected. It is a possibility that many customers will not complain simply because they do not know where, how, and when to file a claim due to lack or unavailability of the guidelines, rules, forms, and other relevant information.

In order to mitigate the problem, regardless of what particular model is chosen, ANRE should establish a transparent publicly accessible reporting convention and framework for all regulated companies, and, maybe, even establish and conduct annual performance review proceedings. ANRE staff should be actively involved in these proceedings collecting relevant information, arranging and conducting public and evidentiary hearings, cross-examining witnesses, making analysis of economic and technical issues, and making recommendations on the Commission's findings. ANRE staff should also play an important role of a mediator between the local electric distribution companies and their complaining customers. Rules and guidelines explaining customers' rights in simple Moldovan, and perhaps Russian, languages should be broadly published and should be made available nationwide.

Under the British model, the customers themselves virtually enforce the standards by pursuing their claims, and ANRE would only play a role of a regulatory watchdog. A provision of penalties for late payment of a penalty to a customer is a part of the mechanism of enforcement

secondary, typically commercial and residential customers. The later have no contracts for service with the electric distribution company and, at present, it is unclear who should be responsible for meeting the standards of quality of service provided to the micronet customers.

of the standards. ANRE would probably have to design special sanctions against the companies who are consistently in non-compliance with the standard requirements, or are persistently reluctant or sluggish in payments. If ANRE prefers a tariff correction through the performance adjustment factor approach, the Commission itself will enforce the standards through the established regulatory framework.

6. CONCLUSIONS

Restructuring and introduction of market reform in the electric power industry in Moldova calls for development and implementation of quality of service standards to ensure a minimum level of service for all customers. ANRE should assume the leading role in the design, monitoring, and enforcement of the standards.

ANRE may consider various mechanisms for implementing such standards, such as the structure adopted in the UK and based on the individual penalties distributed to the particular aggrieved customers, or the mechanism imposing a cumulative penalty based on the individual performance factors and distributed to all customers, or any combination of these two approaches. Regardless of what particular scheme is adopted, ANRE should focus on the elements of service that are most valued by all groups of customers.

If ANRE decides that introduction of power quality elements into the scope of quality of service standards is justified, it should be limited to the long-term voltage deviations from its normal value. In any event, distribution utilities and not ANRE should be involved in field testing of the electrical equipment to verify whether or not the voltage profile meets the standard requirements.

ANRE staff should be involved in monitoring quality of service, handling the customers' complaints, and enforcement of the standards. ANRE should develop procedures, rules, reporting conventions, forms and guidelines for its staff, the low voltage network operators, and the general public, explaining the regulatory framework for the quality of service standards monitoring, revision, and enforcement.